

AMENDMENTS TO THE CLAIMS

1. (Previously Presented) An optical head device comprising:

an objective lens for bringing light emitted from a light source into focus on an information recording medium;

a lens holder for holding said objective lens, said lens holder having a bearing hole formed along a direction parallel to an optical axis of said objective lens, the bearing hole having a diameter that gradually increases while approaching the bearing hole's openings from the bearing hole's center;

a support shaft inserted in said bearing hole;

a light detector for receiving said light reflected from said information recording medium and outputting information about inclination of said objective lens relative to said information recording medium on the basis of said light received; and

an inclination drive unit for, according to said information about said inclination, turning said lens holder on a first axis perpendicular to said support shaft.
2. (Previously Presented) The optical head device according to claim 1, wherein

said bearing hole has a wall that is generally circularly arcuate in cross-sectional shape.
3. (Original) The optical head device according to claim 2, wherein

an equation $(A-B)-L \times \tan\theta$ is generally satisfied, where A is a hole diameter of said bearing hole in the vicinity of said opening, B is a hole diameter of said bearing hole in the

vicinity of said center, L is a length of said bearing hole along said optical axis of said objective lens, and θ is a maximum amount of correction on the turning of said lens holder.

4. (Original) The optical head device according to claim 3, wherein
said (A-B) equals approximately to $88\ \mu\text{m}$ and said L equals approximately to 5 mm.

5. (Currently Amended) The An optical head device according to claim 1, comprising:

~~——an objective lens for bringing light emitted from a light source into focus on an information recording medium;~~

~~——a lens holder for holding said objective lens, said lens holder having a bearing hole formed along a direction parallel to an optical axis of said objective lens;~~

~~——a support shaft inserted in said bearing hole;~~

~~——a light detector for receiving said light reflected from said information recording medium and outputting information about inclination of said objective lens relative to said information recording medium on the basis of said light received; and~~

~~——an inclination drive unit for, according to said information about said inclination, turning said lens holder on a first axis perpendicular to said support shaft,~~

~~——wherein said inclination drive unit includes:~~

electromagnetic drive means comprising a first element mounted on said lens holder on a second axis perpendicular to both said support shaft and said first axis perpendicular to said support shaft, and a second element located opposite said first element; and

a magnetic material fixedly mounted on said lens holder in close vicinity to said second element of said electromagnetic drive means.

6. (Original) The optical head device according to claim 1, further comprising:

a fluid provided in said bearing hole.

7. (Original) The optical head device according to claim 6, wherein

said fluid includes a magnetic fluid.

8. (Original) The optical head device according to claim 7, wherein

said lens holder further includes a permanent magnet located opposite said bearing hole and said magnetic fluid.

9. (Previously Presented) An optical head device comprising:

an objective lens for bringing light emitted from a light source into focus on an information recording medium;

a lens holder for holding said objective lens, said lens holder having a bearing hole formed along a direction parallel to an optical axis of said objective lens, the bearing hole having a diameter that gradually increases while approaching the bearing hole's openings from the bearing hole's center;

a support shaft inserted in said bearing hole; and

a fluid provided in said bearing hole.

10. (Original) The optical head device according to claim 9, wherein
said fluid includes a magnetic fluid.
11. (Original) The optical head device according to claim 10, wherein
said lens holder further includes a permanent magnet located opposite said bearing hole
and said magnetic fluid.
12. (Canceled)
13. (Currently Amended) ~~An~~ ~~The~~ optical head device according to ~~claim 12~~, further
comprising:
a lens holder for holding an objective lens, the objective lens being configured to bring
emitted light into focus on an information recording medium;
a support shaft inserted in a bearing hole of said lens holder, such that said support shaft
is substantially parallel to an optical axis of the objective lens;
a light detector for detecting light reflected from the information recording means in
response to the emitted light;
an inclination drive unit configured to turn said lens holder on a first axis perpendicular
to said support shaft based on information from said light detector, at least part of said
inclination drive unit being arranged on a second axis, which is substantially perpendicular to
said support shaft and the first axis; and

a focusing drive unit including a coil wound around said support shaft, said focusing drive unit being configured to move said lens holder in a focusing direction based on information from said light detector.

14. (Currently Amended) The optical head device according to claim 13, ~~12~~, further comprising:

a tracking drive unit, at least part of said tracking drive unit being arranged on the first axis.

15. (Currently Amended) ~~An~~ The optical head device comprising: according to claim 12

a lens holder for holding an objective lens, the objective lens being configured to bring emitted light into focus on an information recording medium;

a support shaft inserted in a bearing hole of said lens holder, such that said support shaft is substantially parallel to an optical axis of the objective lens;

a light detector for detecting light reflected from the information recording means in response to the emitted light; and

an inclination drive unit configured to turn said lens holder on a first axis perpendicular to said support shaft based on information from said light detector, at least part of said inclination drive unit being arranged on a second axis, which is substantially perpendicular to said support shaft and the first axis,

wherein said inclination drive unit includes a pair of coils arranged on the second axis on either side of the support axis.

16. (Previously Presented) the optical head device according to claim 15, further comprising:

- a tracking drive unit including a pair of coils arranged on the first axis on either side of the support axis;
- a focusing drive unit including a focusing coil wound around the support shaft; and
- a controller having electrical connections to the inclination, tracking, and focusing drive units, respectively,

wherein said controller is operable to apply a current to each electrical connection based on the detected light.

17. (Previously Presented) The optical head device of claim 16, wherein the light detector includes a 2 by 2 matrix of light receiving surfaces, each light receiving surface generating a signal based on the detected light, the controller being configured to apply the currents to the electrical connections based on the signals from the light receiving surfaces.

18. (Currently Amended) ~~An~~ The optical head device of ~~claim 12, further~~ comprising:

- a lens holder for holding an objective lens, the objective lens being configured to bring emitted light into focus on an information recording medium;
- a support shaft inserted in a bearing hole of said lens holder, such that said support shaft is substantially parallel to an optical axis of the objective lens;
- a light detector for detecting light reflected from the information recording means in response to the emitted light; and

an inclination drive unit configured to turn said lens holder on a first axis perpendicular to said support shaft based on information from said light detector, at least part of said inclination drive unit being arranged on a second axis, which is substantially perpendicular to said support shaft and the first axis; and

a base operably connected to said support shaft,

wherein said inclination drive unit includes:

a pair of coils mounted on said lens holder, such that the coils are arranged on the second axis on either side of the support axis; and

a pair of magnets mounted on said base, such that the magnets are arranged on the second axis on either side of the support axis.

19. (Previously Presented) The optical head device of claim 18, further comprising:

a magnetic fluid within said bearing hole.